

IN THE CLAIMS:

Please amend claims 1, 3-5, 7, and 9, and add new claims 10-15 as follows:

1. (Currently Amended) A method for arranging ~~a plurality of orders for printed articles each of which contains one or more printed articles, in order to reduce wasted space when printing the orders~~ in multiple columns, the method comprising the steps of:

obtaining a plurality of orders, each of the orders containing ~~for~~ at least one printed article;

sorting the orders according to the number of printed articles in each order to produce a sorted arrangement of the orders; and

for each successive order in the sorted arrangement of orders, placing the order in a column which currently has a lowest number of total printed articles.

2. (Original) The method of claim 1 further comprising the step of:

placing the first K orders in the sorted arrangement of orders in columns 1 to K where K is the total number of columns.

3. (Currently Amended) The method of claim 1 further comprising the steps of:

determining the number of printed articles in a Ith group in an Mth column;

determining the number of printed articles in the Mth column;

determining the number of printed articles in a Jth group in a Nth column;

determining a number of printed articles in the Nth column; and

exchanging the Ith and Jth groups between the Mth and Nth columns if the following boolean expression is true:

$(L(M) > L(N) \text{ AND } L(I, M) > L(J, N) \text{ AND } L(M) - L(N) > L(I, M) - L(J, N)) \text{ OR}$

$(L(M) < L(N) \text{ AND } L(I, M) < L(J, N) \text{ AND } L(N) - L(M) > L(J, N) - L(I, M))$,

where $L(M)$ is the number of printed articles in the Mth column,

$L(N)$ is the number of printed articles in the Nth column,

$L(I, M)$ is the number of printed articles in the Ith order of the Mth column, and

$L(J, N)$ is the number of printed articles in the Jth order of the Nth column ~~is true~~.

4. (Currently Amended) A method for rearranging a data structure representing a multi column arrangement of a plurality of groups of printed ~~matter~~ articles, the method comprising the steps of:

determining the number of printed articles in a Ith group in a Mth column;
determining the number of printed articles in the Mth column;
determining the number of printed articles in a Jth group in a Nth column;
determining a number of printed articles in the Nth column; and
exchanging the Ith and Jth groups between the Mth and Nth columns if the following boolean expression is true:

$$(L(M) > L(N) \text{ AND } L(I, M) > L(J, N) \text{ AND } L(M) - L(N) > L(I, M) - L(J, N)) \text{ OR} \\ (L(M) < L(N) \text{ AND } L(I, M) < L(J, N) \text{ AND } L(N) - L(M) > L(J, N) - L(I, M)),$$

where $L(M)$ is the number of printed articles in the Mth column,
 $L(N)$ is the number of printed articles in the Nth column,
 $L(I, M)$ is the number of printed articles in the Ith order of the Mth column, and
 $L(J, N)$ is the number of printed articles in the Jth order of the Nth column ~~is true~~.

5. (Currently Amended) The method of claim 4 further comprising the step of:
iteratively selecting different combinations of values of M and N.

6. (Original) The method of claim 4 further comprising the step of:
iteratively selecting different combinations of values of I and J.

7. (Currently Amended) A computer readable medium containing programming instructions for rearranging a data structure representing a multi column arrangement of a plurality of groups of printed ~~matter~~ articles, including programming instructions for:

determining the number of printed articles in a Ith group in a Mth column;
determining the number of printed articles in the Mth column;
determining the number of printed articles in a Jth group in a Nth column;
determining a number of printed articles in the Nth column; and

exchanging the Ith and Jth groups between the Mth and Nth columns if the following boolean expression is true:

$$(L(M) > L(N) \text{ AND } L(I,M) > L(J,N) \text{ AND } L(M) - L(N) > L(I,M) - L(J,N)) \text{ OR}$$

$$(L(M) < L(N) \text{ AND } L(I,M) < L(J,N) \text{ AND } L(N) - L(M) > L(J,N) - L(I,M)),$$

where $L(M)$ is the number of printed articles in the Mth column,

$L(N)$ is the number of printed articles in the Nth column,

$L(I,M)$ is the number of printed articles in the Ith order of the Mth column, and

$L(J,N)$ is the number of printed articles in the Jth order of the Nth column ~~is true~~.

8. (Original) A computer readable medium containing programming instructions for rearranging a data structure representing a multi column arrangement of a plurality of groups of printed matter the computer readable medium including programming instructions for:

determining the number of printed articles in a Ith group in a Mth column;

determining the number of printed articles in the Mth column;

determining the number of printed articles in a Jth group in a Nth column;

determining a number of printed articles in the Nth column; and

exchanging the Ith and Jth groups between the Mth and Nth columns if a boolean expression:

$$(L(M) > L(N) \text{ AND } L(I,M) > L(J,N) \text{ AND } L(M) - L(N) > L(I,M) - L(J,N)) \text{ OR}$$

$$(L(M) < L(N) \text{ AND } L(I,M) < L(J,N) \text{ AND } L(N) - L(M) > L(J,N) - L(I,M))$$

where $L(M)$ is the number of printed articles in the Mth column,

$L(N)$ is the number of printed articles in the Nth column,

$L(I,M)$ is the number of printed articles in the Ith order of the Mth column, and

$L(J,N)$ is the number of printed articles in the Jth order of the Nth column

is true.

9. (Currently Amended) A system for producing custom printed articles, the system comprising:

a high speed printer; and

a server electrically coupled to the high speed printer, the server including:

a processor programmed to:

determine a number of printed articles in a Ith group in a Mth column;

determine a number of printed articles in the Mth column;

determine a number of printed articles in a Jth group in a Nth column;

determine a number of printed articles in the Nth column; and

exchange the Ith and Jth groups between the Mth and Nth columns if a the

following boolean expression is true:

$(L(M) > L(N) \text{ AND } L(I,M) > L(J,N) \text{ AND } L(M) - L(N) > L(I,M) - L(J,N)) \text{ OR}$

$(L(M) < L(N) \text{ AND } L(I,M) < L(J,N) \text{ AND } L(N) - L(M) > L(J,N) - L(I,M)),$

where $L(M)$ is the number of printed articles in the Mth column,

$L(N)$ is the number of printed articles in the Nth column,

$L(I,M)$ is the number of printed articles in the Ith order of the Mth column,

and

$L(J,N)$ is the number of printed articles in the Jth order of the Nth column

is true.

10. (New) The method of claim 4 further comprising the steps of:

obtaining the plurality of groups of printed articles, each of the groups containing at least one printed article;

sorting the groups according to the number of printed articles in each group to produce a sorted arrangement of the groups; and

for each successive group in the sorted arrangement of groups, placing the group in a column which currently has a lowest number of total printed articles.

11. (New) The method of claim 10 further comprising the step of:

placing the first K groups in the sorted arrangement of groups in columns 1 to K where K is the total number of columns.

12. (New) The computer readable medium of claim 7 further including programming instructions for:

obtaining the plurality of groups of printed articles, each of the groups containing at least one printed article;

sorting the groups according to the number of printed articles in each group to produce a sorted arrangement of the groups; and

for each successive group in the sorted arrangement of groups, placing the group in a column which currently has a lowest number of total printed articles.

13. (New) The computer readable medium of claim 12 further including programming instructions for:

placing the first K groups in the sorted arrangement of groups in columns 1 to K where K is the total number of columns.

14. (New) The system of claim 9 wherein the processor is further programmed to:

obtain the plurality of groups of printed articles, each of the groups containing at least one printed article;

sort the groups according to the number of printed articles in each group to produce a sorted arrangement of the groups; and

for each successive group in the sorted arrangement of groups, place the group in a column which currently has a lowest number of total printed articles.

15. (New) The system of claim 14 wherein the processor is further programmed to:

place the first K groups in the sorted arrangement of groups in columns 1 to K where K is the total number of columns.